

HIGH DENSITY PLASMA PROBING WITH SOFT X-RAY LASERS

F. Weber, T.W. Barbee, Jr., R. Cauble, P. Celliers, L. B. Da Silva, C. D. Decker,
R.A. London, J.C. Moreno, R. Snavely, J.E. Trebes, and A.S. Wan

*University of California, Lawrence Livermore National Laboratory,
P.O. Box 808, Livermore, California, 94550*

Collisionally pumped soft x-ray lasers are reliable radiation sources and due to their intensity, wavelength and coherence properties ideally suited for a wide variety of high density plasma diagnostics. We have successfully used an XUV interferometer operating at 155 Å to determine the electron density distribution in laser produced plasmas and are currently working on Moiré deflectometry for studying ICF hohlraums.

We will describe our most recent research effort to probe the electron density within a hohlraum target relevant to the inertial confinement fusion process. In all of the experiments we employ optimized multilayer technology as x-ray optical components in order to take advantage of the unique characteristics of the neon-like yttrium x-ray laser. Possible improvements and future plans which include more detailed probing for hohlraum targets by means of interferometry will also be discussed.

** Work performed under the auspices of the U. S. Department of Energy by Lawrence Livermore National Laboratory under contract number W-7405-ENG-48*